

Thomas Kirn: The AMS-02 Detector

The Alpha Magnetic Spectrometer (AMS-02) is a general purpose high energy particle detector to search for dark matter and antimatter and to study primordial cosmic ray particles in the energy range from 0.5 to 2000 GeV.

There is a strong demand for precision measurements of cosmic particles as the recent measurements of the positron to electron fraction ( $\frac{e^+}{e^+ + e^-}$ ) by AMS-01, HEAT, PAMELA and Fermi-LAT show significant deviations from the expectation for purely secondary production. A possible source of this excess could be dark matter annihilation, a nearby pulsar or a too limited sensitivity and systematic effects of the experiments.

The indirect search for dark matter candidates requires precise  $e^+$ -spectroscopy with a suppression of the dominant proton background by six orders of magnitude. In AMS-02 it will be achieved with a combination of an electromagnetic calorimeter and a transition radiation detector.

The AMS-02 detector was successfully launched onboard STS-134 mission on May 16th, 2011 and deployed on the International Space Station (ISS) on May 19th, 2011. AMS-02 is steadily collecting data at a rate of  $1.4 \times 10^9$  events per month since its activation on the ISS.

The detector itself and selected aspects of the performance of the instrument will be presented.